

Hongzhang “Steve” Shao

CONTACT	<i>E-mail:</i> <code>steve.shao@chicagobooth.edu</code> <i>Page:</i> https://steve-shao.github.io
RESEARCH	My research focuses on solving practical industrial and operational problems. I began by solving revenue management problems, such as demand estimation, assortment planning, and pricing, in the retail industry. Now, I am tackling larger-scale problems in transportation and airline systems . I love models that are interpretable, robust and computationally efficient. Traditional optimization methods and deep learning techniques are both in my toolbox.
ACADEMIC EMPLOYMENT	University of Chicago, Booth School of Business, Chicago, USA <i>Postdoctoral Principle Researcher</i> (Supervisor: Baris Ata) December 2023 - Present
EDUCATION	Georgia Institute of Technology, Atlanta, USA <i>Ph.D. in Operations Research</i> (Advisor: Anton Kleywegt) December 2023 <i>M.S. in Statistics</i> December 2023 <i>M.S. in Operations Research</i> December 2015 Zhejiang University, Hangzhou, China <i>B.E. in Automation & Engineering</i> June 2014 <i>Morningside Scholar in China Studies</i>
INDUSTRIAL EXPERIENCE	Cardinal (Shanshu) Operations LLC, Shanghai, China <i>Operations Research Intern</i> Summer 2019 – Led a revenue management (product pricing) project for a leading beer manufacturer. – Built multi-SKU (nested logit) choice models to analyze consumer behavior in major cities. – Implemented joint price optimization over SKUs, channels & cities. WestRock Company, Atlanta, USA <i>Operations Research Intern</i> Summer 2017 – Implemented a spare parts inventory control model & a 3D bin packing optimization model. – Developed demo web-apps with dynamic data visualizations for both projects. Gimme Vending LLC, Atlanta, USA <i>Data Scientist Consultant</i> February 2016 - March 2017 – Developed product assortment planning algorithms based on discrete choice models. – Implemented the algorithms on AWS (Linux server) with PostgreSQL, R & RStudio Server. – Conducted 2 field tests on 10 machines; Both resulted in > 10% improvements on sales. – Developed & deployed an assortment planning web application with RMarkdown & Shiny.
TOOLBOX	Data Science: Python, R & Shiny, SQL, Amazon Web Services, Google Cloud Platform Optimization: CVX, Gurobi, Mosek, PyTorch Documentation: Markdown, LaTeX, HTML, CSS, Jekyll, Hugo

PUBLICATIONS

In Preparation

- Ata, B., & Shao, H., *Dynamic Capacity Control for Network Revenue Management: A Computational Method Based on Neural Networks*.
- Kleywegt, A. J., Li, Y. & Shao, H., *A Markov Decision Process Model for Drivers' Relocating Behavior in Ride-Hailing Systems*.

Preprints

- Kleywegt, A. J., & Shao, H. (2022). *Revenue Management Under the Markov Chain Choice Model with Joint Price and Assortment Decisions*. arXiv:2204.04774.
- Kleywegt, A. J., & Shao, H. (2021). *Optimizing Pricing, Repositioning, En-Route Time, and Idle Time in Ride-Hailing Systems*. arXiv:2111.11551.
- Kleywegt, A. J., & Shao, H. (2020). *Tractable Constrained Optimization over Multiple Product Attributes under Discrete Choice Models*. arXiv:2007.09193.
- Kleywegt, A. J., & Shao, H. (2020). *Joint Estimation of Discrete Choice Model and Arrival Rate with Unobserved Stock-out Events*. arXiv:2003.02313.

Journal Papers

- Wang, T., Shao, H., Qu, X. , & Eliasson J. (2023). *Consolidating Passenger and Freight Transportation in an Urban-Rural Transit System*. Fundamental Research.
- Qu, X., Shao, H., Wang, S., & Wang, Y. (2022). *Are More Charging Piles Imperative to Future Electrified Transportation System?*. Fundamental Research.

PRESENTATIONS

Revenue Management Under the Markov Chain Choice Model with Joint Price and Assortment Decisions

- IISE Annual Conference, New Orleans, LA, May 2023
- INFORMS Annual Meeting, Phoenix, AZ, US, October 2023

Optimizing Pricing, Repositioning, En-Route Time, and Idle Time in Ride-Hailing Systems

- IISE Annual Conference, New Orleans, LA, May 2023
- City University of Hong Kong, Hong Kong, China, May 2023
- Tristan XI (The 11th Triennial Symposium on Transportation Analysis), Mauritius Island, June 2022
- Odysseus 2021 (The 8th International Workshop on Freight Transportation and Logistics), Tangier, Morocco, May 2022
- INFORMS Annual Meeting, Anaheim, CA, US, October 2021

Tractable Constrained Optimization over Multiple Product Attributes under Discrete Choice Models

- CSAMSE 2021 (The 13th International Conference of the Chinese Scholars Association for Management Science and Engineering), Shanghai, China, July 2021
- INFORMS Annual Meeting, Seattle, WA, US, October 2019

Joint Estimation of Discrete Choice Model and Arrival Rate with Unobserved Stock-out Events

- Imperial College Business School, London, UK, May 2019
- INFORMS Annual Meeting, Phoenix, AZ, US, November 2018

TEACHING

Instructor:

– ISyE 3133 Engineering Optimization (Studio) Spring 2021

Teaching Assistant:

– ISyE 3232 Stochastic Manufacturing and Service Systems Summer 2023
– ISyE 7406 Data Mining and Statistical Learning Spring 2023
– ISyE 6664 Stochastic Optimization Fall 2022
– ISyE 6644 Simulation Summer 2022
– ISyE 6201 Manufacturing Systems Spring 2022
– ISyE 6383 Supply Chain Operations Fall 2018, Fall 2019, Fall 2020, Fall 2021
– ISyE 6414 Regression Analysis Summer 2020, Summer 2021
– ISyE 6402 Time Series Analysis Spring 2020
– ISyE 6501 Analytics Modeling Spring 2019
– ISyE 4803 Warehousing Systems Spring 2018
– ISyE 3104 Supply Chain & Warehousing Models Fall 2017

INTERESTS

Quantitative Trader

Serious Amateur Magician

– Former President, Magicians Association of Zhejiang University
– Former Board Member, College Magic Union of Zhejiang Province, China

Intensive Reader on History, Sociology & Psychology topics